

App. No. 09/779,789
Amendment dated 8/15/2005
Reply to Final Office Action of 06/15/2005

Attn. Docket No. VELCP008XIC

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-3 (canceled)

Claim 4 (currently amended) The An apparatus of Claim 1, further for channel estimation in a communication device having a transmit path and a receive path both coupled to a communication medium, and the apparatus comprising;

a pseudo-random noise generator (PRN) coupled to the transmit path to inject the a codeword consisting of '+1's together with '-1's or '0's together with '1's; and into the transmit path;

a correlator coupled to the receive path to generate an ordered set of correlation coefficients corresponding with successive phasings of the codeword with respect to a received signal, and the correlator including:

- a detector to detect peaks within the ordered set of correlation coefficients including both a peak corresponding with a leakage signal together with at least one other peak corresponding to a reflection of the injected codeword by the communication medium, and the detector determining at least one of the offset between peaks or a relative magnitude of the peaks, thereby estimating the channel characteristics across the communication medium;
- a plurality of XOR gates each with an output and a pair of inputs a first of which pair of inputs couples to a corresponding bit of the codeword and a second of which pair of inputs couples to a corresponding sample of the received signal;

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- a shifter to shift the codeword with respect to the corresponding samples of the received signal or vice-versa; and
- a summer coupled to the outputs of each bit of the plurality of XOR gates to sum the outputs of the plurality of the plurality of XOR gates codeword on each shift of the shifter, thereby generating successive ones of the ordered set of correlation coefficients.

Claims 5-7 (canceled)

Claim 8 (currently amended) The An apparatus of Claim 1, wherein the detector further comprises: for channel estimation in a communication device having a transmit path and a receive path both coupled to a communication medium, and the apparatus comprising:

a pseudo-random noise generator (PRN) coupled to the transmit path to inject a codeword into the transmit path;

a correlator coupled to the receive path to generate an ordered set of correlation coefficients corresponding with successive phasings of the codeword with respect to a received signal, and the correlator including:

- a detector to detect peaks within the ordered set of correlation coefficients including both a peak corresponding with a leakage signal together with at least one other peak corresponding to a reflection of the injected codeword by the communication medium, and the detector determining at least one of the offset between peaks or a relative magnitude of the peaks, thereby estimating the channel characteristics across the communication medium; and the detector including:
 - a peak detector for detecting peaks within the ordered set of correlation coefficients;

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- o a leakage peak detector for determining which among the peaks detected by said peak detector corresponds with the leakage peak; and
- o a sequencer for sequentially ordering the peaks corresponding with a time of receipt of each of the reflected signals with respect to the peak corresponding with the time of receipt of the leakage signal to estimate channel characteristics for the communication medium.

Claims 9-15 (canceled)

16. (currently amended) The A method of Claim 12, further for channel estimation in a communication device having a transmit path and a receive path both coupled to a communication medium, and the method comprising the acts of:

injecting a pseudo-random codeword signal into the transmit path of the communication device;

generating from the receive path an ordered set of correlation coefficients corresponding with successive phasings of the pseudo-random codeword with respect to a received signal resulting from the injecting act;

detecting peaks within the ordered set of correlation coefficients including both a peak corresponding with a leakage signal together with at least one other peak corresponding to a reflection of the injected pseudo-random codeword by the communication medium; and

determining which among the peaks detected in the detecting act corresponds with the leakage peak; and

sequentially ordering the peaks corresponding with a time of receipt of each of the reflected signals with respect to the leakage signal to estimate channel characteristics for the communication medium; and

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determining at least one of the offset between peaks or a relative magnitude of the peaks, thereby estimating the channel characteristics across the communication medium.